We Claim:

1. A method for reducing pain associated with a post-surgical adhesion, comprising administering to a patient in need thereof to a site destined to form an adhesion, an ionically cross-linked gel comprising:

a polyacid (PA);

a polyalkylene oxide (PO); and

a multivalent monoatomic cation.

2. The method of claim 1, wherein said polyacid is selected from the group consisting of a carboxypolysaccharide, polyacrylic acid, polyamino acid, polylactic acid, polyglycolic acid, polymethacrylic acid, polyterephthalic acid, polyhydroxybutyric acid, polyphosphoric acid, polystyrenesulfonic acid, and copolymers of said polyacids.

3. The method of claim 1, wherein the polyacid is a carboxypolysaccharide selected from the group consisting of carboxymethyl cellulose (CMC), carboxyethyl cellulose, chitin, carboxymethyl chitin, hyaluronic acid, alginate, propylene glycol alginate, pectin, carboxymethyl dextran, carboxymethyl chitosan, heparin, heparin sulfate, chondroitin sulfate and polyuronic acids including polymannuronic acid, polyglucuronic acid and polyguluronic acid..

4. The method of claim 1, wherein the polyacid is carboxymethylcellulose.

5. The method of claim 1, wherein the polyacid is carboxymethylcellulose having a molecular weight in the range of about 10 kd to about 10,000 kd and a degree of substitution in the range of greater than about 0 to about 3.

6. The method of claim 1, wherein said polyalkylene oxide is selected from the group consisting of polypropylene oxide, polyethylene glycol, polyethylene oxide, and PEO/PPO

block copolymers.

7. The method of claim 1, wherein said polyalkylene oxide is polyethylene oxide or polyethylene glycol having a molecular weight in the range of about 200 d to about 8000 kd.

8. The method of claim 1, wherein said polyalkylene oxide is polyethylene glycol having a molecular weight in the range of about 200 d to about 5 kd.

9. The method of claim 1, wherein said PA is in the range of about 10 % to about 99 % by weight, of the total solids content.

10. The method of claim 1, wherein the PA is in the range of about 50 % by weight to about 99 % by weight, of the total solids content.

11. The method of claim 1, wherein the PA is in the range of about 90 % by weight to about 99 % by weight, of the total solids content.

12. The method of claim 1, wherein the PO is in the range of about 1 % by weight to about 90 % by weight, of the total solids content.

13. The method of claim 1, wherein the PO is in the range of about 1 % by weight to about 10 % by weight, of the total solids content.

14. The method of claim 1, wherein the PO is about 2.5 % by weight, of the total solids content.

15. The method of claim 1, wherein the total solids content of the gel is in the range of about 1 % to about 10 %.

16. The method of claim 1, wherein said cation is a trivalent cation.

17. The method of claim 1, wherein said cation is selected from the group consisting of Fe^{+3}, Al^{+3}, and Cr^{+3}.

18. The method of claim 1, wherein said cation is a divalent cation.

19. The method of claim 1, wherein said cation is a divalent cation selected from the group consisting of Ca^{+2}, Zn^{+2}, Mg^{+2} and Mn^{+2}.

20. The method of claim 1, wherein said cation is accompanied by an inorganic anion.

21. The method of claim 1, wherein said cation is accompanied by an inorganic anion selected from the group consisting of Cl, PO_4^{2-}, HPO_3^{-}, CO_3^{2-}, HCO_3^{-}, SO_4^{2-} and borates.

22. The method of claim 1, wherein said cation is accompanied by an organic anion.

23. The method of claim 1, wherein said cation is accompanied by an organic anion selected from the group consisting of citrate, oxalate and acetate.

24. The method of claim 1, wherein the pH of the gel is in the range of about 2.0 to about 7.5.

25. The method of claim 1, wherein the pH of the gel is in the range of about 2.5 to about 6.0.

26. The method of claim 1, further comprising a drug.

27. The method of claim 1, further comprising a drug selected from the group consisting

of antithrombogenic drugs, anti-inflammatory drugs, hormones, chemotactic factors, analgesics, growth factors, cytokines, osteogenic factors and anesthetics.

28. The method of claim 1, further comprising a drug selected from the group consisting of heparin, tissue plasminogen activator, aspirin, ibuprofen, ketoprofen, proteins and peptides containing an RGD motif, and non-steroidal anti-inflammatory drugs.

29. The method of claim 1, wherein said composition has a viscosity below about 500,000 centipoise.

30. A method for decreasing pain associated with a post-surgical adhesion comprising the step of placing the composition in contact with a tissue that in the absence of said gel would form an adhesion with an adjacent tissue; said composition comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

31. A method for decreasing pain associated with a post-surgical adhesion comprising the steps of:

(a) accessing a surgical site;

(b) performing a surgical procedure; and

(c) placing a composition in contact with a tissue that in the absence of said gel would form an adhesion with an adjacent tissue; said composition comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

32. The method of claim 30, wherein said surgical procedure is selected from the group consisting of abdominal, ophthalmic, orthopedic, gastrointestinal, thoracic, cranial,

cardiovascular, gynecological, urological, plastic, musculoskeletal, spinal, neural, fascial, tendon, otorhinolaryngological and pelvic.

33. The method of claim 30, wherein said surgical procedure is selected from the group consisting of appendectomy, cholecystectomy, hernial repair, lysis of peritoneal adhesions, kidney surgery, bladder surgery, urethral surgery, prostate surgery, salingostomy, salpingolysis, ovariolysis, removal of endometriosis, surgery to treat ectopic pregnancy, myomectomy of uterus, myomectomy of fundus, hysterectomy, laminectomy, discectomy, tendon surgery, spinal fusion, joint replacement, joint repair, strabismus surgery, glaucoma filtering surgery, lacrimal drainage surgery, sinus surgery, ear surgery, bypass anastomosis, heart valve replacement, thoracotomy, synovectomy, chondroplasty, removal of loose bodies and resection of scar tissue.

34. A method for decreasing pain associated with a post-traumatic adhesion, comprising the step of delivering to a site of trauma a composition comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

35. The method of claim 34, further comprising, prior to the step of delivering, the step of accessing a site of trauma.

36. A method of decreasing pain associated with adhesion reformation, comprising the steps of:

(a) resecting said adhesion to separate the previously adherent tissues; and

(b) placing a composition between the previously adherent tissues; said composition comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

37. A method of claim 36, further comprising, before said step of resecting, the step of accessing a site having an adhesion.

38. A method for decreasing pain associated with surgical trauma caused by a surgical instrument, comprising coating said surgical instrument with a composition prior to using said surgical instrument, said composition comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

39. A method for decreasing pain associated with friction between adjacent tissues, comprising placing a composition between said adjacent tissues, said composition comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

40. A method for decreasing pain associated with surgery for post-surgical adhesions, comprising placing a membrane at the site of surgery, said membrane comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

41. The method of claim 1, wherein said composition comprises an association complex of a carboxypolysaccharide (CPS) and a polyether (PE), which possesses at least one property selected from the group consisting of bioresorbability, bioadhesiveness, antithrombogenicity, and antiadhesion, and wherein the composition has a pH in the range of

about 2.5 to about 4.5 and is hydratable by at least about 100%.

42. The method of claim 41, wherein the CPS is selected from the group consisting of carboxymethyl cellulose (CMC), carboxyethyl cellulose, chitin, carboxymethyl chitin, hyaluronic acid, alginate, propylene glycol alginate, carboxymethyl chitosan, pectin, carboxymethyl dextran, heparin, heparin sulfate, chondroitin sulfate and polyuronic acids including polymannuronic acid, polyglucuronic acid and polyguluronic acid.

43. The method of claim 40, wherein the molecular weight of the CPS is between 100 kd and 10,000 kd.

44. The method of claim 40, wherein the molecular weight of the PE is between about 4 kd and about 8000 kd.

45. The method of claim 40, wherein the CPS is CMC.

46. The method of claim 40, wherein the PE is polyethylene oxide (PEO).

47. The method of claim 40, wherein the proportion of total solids content of the CPS is from 10 % to 95 % by weight, and the proportion of the PE is from 5 % to 90 % by weight.

48. The method of claim 1, wherein the proportion of total solids content of the composition is about 10% polyacid and about 90% polyalkylene oxide.

49. The method of claim 40, wherein the degree of substitution of the CPS is from greater than about 0 up to and including about 3.

50. The method of claim 1, further comprising a drug.

51. The method of claim 1, wherein said drug is an analgesic or an anesthetic.

52. The composition of claim 40, further comprising multiple layers of membranes of CPS and PE.

53. The method of claim 40, wherein said membrane has at least one property of being bioadhesive, resorbable or flexible, and wherein the property is adjusted by selecting at least one member from the group consisting of: (1) the molecular weight of the CPS in the range of about 100 kd and about 10,000 kd, (2) the molecular weight of the PE in the range of about 5 kd and about 8000 kd, (3) the degree of substitution of the CPS in the range of greater than about 0 and up to and including about 3, (4) the proportion of the CPS and the PE, wherein the proportion of the CPS in from about 10 % to about 95 % by weight, and the proportion of the PE is in the range of about 5 % to about 90 % by weight and (5) the membrane pH below between about 2.5 and about 4.5.

54. The method of claim 40, wherein said membrane further comprising a plasticizer.

55. The method of claim 54, wherein the plasticizer is selected from the group consisting of glycerol, ethanolamines, ethylene glycol, 1,2,6-hexanetriol, monoacetin, diacetin, triacetin, 1,5-pentanediol, PEG, propylene glycol, and trimethylol propane.

56. The method of claim 54, wherein the concentration of said plasticizer is in the range of greater than about 0 % to about 30 % by weight.

57. The method of claim 40, wherein the plasticizer is glycerol in a concentration in the range of about 2 % to about 30 % by weight.

58. A gel comprising 4% total solids content in aqueous solution, the total solids content of said gel comprising:

about 89.5 gm/100 ml solution of CMC (7HF) having

a molecular weight of about 700,000 daltons;

a degree of substitution between about 0.81 and about 089;

about 10% PEO having a molecular weight of about 4,000 kdaltons; and

about 0.2 to about 0.5 % $CaCl_2$.

59. The gel of claim 58, wherein the viscosity of said gel is between

about 200,000 centipoise and

about 300,000 centipoise.

60. A gel comprising about 4% total solids content in aqueous solution, the total solids content of said gel comprising:

about 97 gm/100 ml solution CMC (7HF) having

a molecular weight of about 700,000 daltons;

a degree of substitution of between

about 0.81 and

about 0.89;

about 2.5 gm/100 ml solution of PEO having a molecular weight of about 4,000 kdaltons; and

about 0.2 gm/ml solution to about 0.5 gm/100 ml solution of $CaCl_2$.

61. The gel of claim 60 having a viscosity of between

about 200,000 centipoise and

about 300,000 centipoise,

as measured at ½ rpm.

62. A method for reducing organ dysfunction associated with a post surgical adhesion, comprising the steps of:

(a) accessing a surgical site that in the absence of gel would form an adhesion tethering said organ to another organ; and

(b) delivering to said site, the gel of claim 1.

63. The method of claim 62, wherein the surgical procedure is selected from the group consisting of orthopedic, ophthalmic, gastrointestinal, abdominal, adnexal, thoracic, cranial, otorhinolaryngological, cardiovascular, gynecological, arthroscopic, urological, dermal, subdermal, plastic and musculoskeletal.

64. The method of claim 62, further comprising the step of placing a dried composition of a CPS and a PE over said gel.

65. A method for decreasing pain associated with formation of a post surgical adhesion, comprising the steps of:

accessing a surgical site that in the absence of a gel would form an adhesion between at least two structures not normally tethered to each other; and

delivering to said site, an ionically cross-linked gel, comprising:

a polyacid;

a polyalkylene oxide; and

a multivalent monoatomic cation.

66. The method of claim 65, wherein said surgical site is adnexal, thoracic or pericardial.